City of Beaverton
2002 Water Quality Report

Your Water Quality Is Our First Priority

The City of Beaverton is pleased to provide you with this 2002 Water Quality Report. The purpose of the report is twofold:

1. To provide you with information about your drinking water and

2. To comply with U.S. Environmental Protection Agency (EPA) reporting requirements.

The City of Beaverton is proud of the high quality of its water supply, which meets or exceeds all State and Federal water quality requirements. If you have any questions regarding your water quality or about information presented in this report, please call us at (503) 350-4017.

This information is available in alternative formats. Alternative formats can be provided upon request with a one week notice. To request alternative formats, please call (503) 350-4017.

Si habla español:
Este informe contiene información muy importante. Pídale a un amigo que lo entienda bien que se lo traduzca.

Using data collected during 2002, we have summarized information about your water supply sources, the water facilities that deliver water to your tap, and the quality of your drinking water.
As we have done in the past, we are also taking this opportunity to present additional information about other programs under way that are helping to ensure you have safe and dependable drinking water.

Beaverton's Water System at a Glance

The City of Beaverton supplies water to approximately 62,000 or 79 percent of the total 78,820 residents who live within the city limits. The remaining 21 percent, or approximately 17,000 residents, receive their water from the Tualatin Valley Water District, West Slope Water District, and Raleigh Water District.

The City of Beaverton is a member of the Joint Water Commission (JWC), an intergovernmental water supply group whose owner-members include Beaverton, Hillsboro, Forest Grove, and the Tualatin Valley Water District. The JWC was formed to store, manage, and treat water for its member agencies.

As a resident of Beaverton within the City's water service area, the primary source of your water is from the JWC water treatment plant located south of Forest Grove. The City has a 25 percent ownership right in the facilities operated by the JWC. The water treatment plant filters raw water (before treatment) pumped from the nearby Tualatin River. The treatment plant has a peak capacity of 70 million gallons of drinking water per day. Beaverton owns a share in the JWC treatment plant, entitling the City to up to 15 million gallons per day (mgd) of treated drinking water, which meets state and federal drinking water standards.

During the summer, when Tualatin River streamflow is low, water is released from Hagg Lake (Scoggins Reservoir) and Barney Reservoir (a dam on the Trask River in the coastal mountains) to compensate for the amount removed from the River for Beaverton's summer use. The City of Beaverton owns yearly water rights to 1.3 billion gallons (4,000 acre-feet) in Scoggins Reservoir/Hagg Lake and 1.4 billion gallons (4,300 acre-feet) in Barney Reservoir.

During the summer when water demand is high and the Tualatin River streamflow is low, water stored in Henry Hagg Lake and Barney Reservoir is released into the Tualatin River for downstream withdrawal and treatment for drinking water. Henry Hagg Lake and Barney Reservoir supply most of Beaverton's raw water during the summer. Water prior to being treated is considered raw water. Release of stored raw water from the two dams increases summertime streamflow in the Tualatin River, which contributes to sustaining a healthy river ecosystem.

Stored Trask River water released from Barney Reservoir is diverted through a short pipeline across a narrow Coast Range divide into the headwaters of the Tualatin River. Water released from Henry Hagg Lake travels by way of Scoggins Creek to the Tualatin River. Downstream, raw water is withdrawn from the Tualatin River and pumped to the JWC water treatment plant (see figure, left).

Drinking water produced in the JWC treatment plant is pumped about one-half mile to Fern Hill Reservoir, a 20-million-gallon, aboveground storage reservoir. A second JWC reservoir is currently under design with a planned capacity of 27 million gallons (MG). From Fern Hill Reservoir, water travels approximately 18 miles by gravity through a large-diameter transmission line to Beaverton and the City's two terminal storage reservoirs. The in-town terminal storage reservoirs hold a combined total of 20 million gallons and are owned and operated by the City. Water reaches Beaverton water customers through a network of distribution pipes and valves. The City also maintains an additional three in-town water storage reservoirs, for a total of over 28 million gallons. In-town storage tanks hold about a 3-day supply at an average daily demand. Sufficient in-town water storage is important to meet high summer day demands, emergencies, large fires, or interruptions in supply from the JWC.

Relationships with Other Water Provider Agencies

The City of Beaverton has drinking water supply relationships with the Tualatin Valley Water District, the City of Portland, and the City of Tigard. These public water providers can supply water to the City through interties (pipeline connections), if needed. For the Tualatin Valley Water District, the City has two pipeline connections on the north side of the water system. The City of Beaverton has a pipeline connection on the east side of its water system with the City of Portland. Beaverton has three pipeline connections with Tigard located along the City's southern border. Tigard has a water supply agreement with the JWC. The Tigard pipeline connections are used to supply up to 4 mgd of JWC water to the City of Tigard. Water is "wheeled" from the JWC treatment plant through transmission lines and then through Beaverton's water distribution piping and pipeline connections to Tigard. During 2002, 2 mgd of drinking water originating from the JWC was "wheeled" through Beaverton's water mains to Tigard. Beginning in spring 2003, the amount of water wheeled to Tigard was increased to 4 mgd and is intended to remain at that level for the remainder of the 2003 calendar year, assuming the JWC has ample water supplies over the summer.

The Tualatin Valley Water District water consists of a blend of JWC and Portland water. The Portland water, when supplied to Beaverton through the intertie, consists solely of Bull Run water. During 2002, the City of Beaverton did not purchase water from the City of Portland or the Tualatin Valley Water District. The City was able to meet peak summer-time demands using its Aquifer Storage and Recovery (ASR) facilities. In 2002, the JWC supplied 3.4 billion gallons of water to the City of Beaverton.

These inter-city relationships are very important and ensure that the City of Beaverton will be able to supply water to its customers when the water levels in the Tualatin River limit withdrawal under the City's existing in-stream water rights, or when stored raw water is limited in the summer as in 2001 or in the event of a water supply emergency.

Water Storage for Summer Supply — Do We Have Enough?

In the winter and spring when ample streamflow is available, the City utilizes its in-stream water rights to obtain water from the Tualatin River. The City's winter water rights on the Tualatin River (usually available from November to late May) allow daily use of up to 16.2 mgd. To give you some perspective, the City's average daily water consumption for 2002 was 8.9 mgd, with the highest day demand of over 15 mgd. By the year 2020, even with conservation expected to reduce peak demand over time, the City's average daily demand is estimated to be 11 mgd and its peak demand is expected to reach 22 mgd. Consequently, the City is pursuing other alternatives to help meet increased water demand, such as Aquifer Storage and Recovery (ASR) and storage expansion options at the Scoggins Dam (Hagg Lake). The City together with other interested west-side cities and public agencies in Washington County, including the JWC, are participating in preliminary studies to evaluate a number of alternatives to increase water for various uses in the Tualatin River basin. Clean Water Services of Washington County is leading the Water Supply Feasibility Study. The most promising alternative appears to be increasing the storage capacity of Henry Hagg Lake (Scoggins Reservoir) by 16.5 billion gallons (50,600 acre-feet) by raising the Scoggins Dam up to 40 feet higher.

The JWC is pursuing another new water supply related project: the Raw Water Pipeline. This project involves the development of a large diameter pipeline system that will carry water directly from the Scoggins Reservoir (Henry Hagg Lake) to the JWC water treatment plant. A feasibility and route location alternatives study is underway by a consultant working for the JWC. The proposed 7-mile long pipeline will serve a number of important functions:

- It will enhance the JWC's system operations, efficiency and it will help with water conservation.
- It will reduce the risk of stream bank erosion due to large water releases from Hagg Lake in the summer.
- It will increase streamflow and lower water temperatures during the summer, which helps river water quality. Part of the water carried by the pipeline will be released downstream into the Tualatin River near the JWC treatment plant.
- It will help protect the quality of water to be treated by the JWC because water will be transported in a pipe from Hagg Lake directly to the treatment plant, not down the stream channel.

Aquifer Storage and Recovery

Project Update

The City has been testing and using Aquifer Storage and Recovery (ASR) at its Sorrento Water Works site, located on Hanson Road in Beaverton since 1999. The City has two ASR wells at the site, referred to as ASR No. 1 (retrofit of the old Hanson Road well) and ASR No. 2. Construction of a third well (ASR No. 4) at the Sorrento Water Works site is scheduled to begin in 2004. The City owns a fourth ASR well site (ASR No. 3) near Scholls Ferry Road and Barrows Road. This ASR facility most likely will be brought on line in 2005 or 2006; a test well has already been completed at this site.

Beaverton's ASR program involves injecting treated drinking water from the JWC water treatment plant into natural underground basalt formations (aquifers), where it is stored for later use. Water is stored in a basalt aquifer (volcanic rock with porous cavities much like an irregular honeycomb). When demand increases in the summer or during an emergency, the water can be pumped back out and used. The water is stored during the winter months, when it is plentiful and the demand is low. Water availability for Beaverton is higher in the winter due to higher flows in the coastal range Trask and Tualatin Rivers. Stored water is then pumped back out of the aquifer during the summer when demand increases. Beaverton residents drink more water in the summer and use it for outdoor activities, primarily as irrigation for landscaping, washing cars and cleaning paved surfaces. In essence, an ASR well acts as a vast underground drinking water storage facility; 150 million gallons of storage per well is the typical goal. For comparison, a typical municipal storage tank ranges from 1 to 20 million gallons in size.

ASR is beneficial in a number of ways. For example, it can help meet future water demands, as well as postpone or limit the need to purchase water from other sources. And the City may also be able to postpone building new aboveground storage reservoirs, which are more expensive than ASR. Moreover, ASR does not deplete the native groundwater resource and it helps to keep streamflows high in the dry season, which benefits fish and other aquatic life. Recovered ASR water is cooler than surface water in the summer, which is an added benefit. And, finally, stored water is an excellent backup emergency supply in case something should happen to the City's main transmission line from the JWC treatment plant.

The aquifer at the Sorrento Water Works site consists of horizontal fractured rock and rubble zones located between individual basalt flows. Drinking water supplied by the JWC treatment plant is injected into the horizontal zones for storage. On recovery, the water looks and tastes aesthetically pleasing. In contrast, native groundwater contains minerals that create harder tasting water. Using its water wells, the City can pump native groundwater once the ASR stored water has been used up. Native groundwater is normally blended with softer JWC-treated water.

In 2002, the City recovered approximately 295 million gallons of stored JWC water using ASR No. 1 and No. 2. In addition, the City continued to use the wells in the summer to recover an additional 106 million gallons of native groundwater utilizing its native groundwater rights. A total of 401 million gallons of water were pumped out of the City's wells at the Sorrento Water works facility, which helped immensely to meet peak summer demands in 2002. For some perspective, the two wells are capable of recovering up to 3 mgd, which represents about 18 percent of the City's summer-time peak demand of about 15 mgd.

Voluntary Water Conservation

The 2001 water shortage and last year's extremely dry fall brought home the need to use water wisely. Water conservation is an important component to the City's water management plan. Did you know that 97 percent of the world's water is saline or otherwise undrinkable and another 2 percent is locked up in the polar ice caps and glaciers? That leaves just 1 percent for all of humanity's needs — for agriculture, manufacturing, community use, and personal households. No wonder water is such a precious commodity! Conservation tips can be found on the City's Web site and include such suggestions as when to water your yard, how to save water in and around your garden, planting tips to conserve water, and much more. Please check this information out at www.ci.beaverton.or.us and www.conserveh2o.org.

Other City Projects

Numerous utility and infrastructure projects are under way in Beaverton. With 222 miles of waterlines, 239 miles of sanitary sewers, and 208 miles of underground storm drainage pipes, the City maintains an active annual replacement program of underground utilities. Some of the water-related projects that are completed, under way, or projected are summarized below:

Water Pipeline Work

- SW Cedar Hills Boulevard Waterline Replacement and Upgrade, Phases 2 & 3.
- SW Hart Road Waterline Replacement and Upgrade.
- SW 125th Avenue and Greenway Drive Intersection Waterline Replacement and Upgrade.
- SW Lombard Avenue – Farmington to Broadway Waterline Replacement and Upgrade.
- Millikan Way Waterline Project.

ASR Project

- ASR No. 4 drilling and well house/pumping station construction, which is scheduled to be completed in 2004.
- Henry Street Waterline Extension.

JWC Project

- Construction of the 27 million gallon Fern Hill Reservoir No. 2. Beaverton's share is 25 percent.

Miscellaneous Projects

- Leak detection and repair throughout the City's water supply system. In 2002, leaks in 46 mains (2 inches or more in diameter) and 560 water meter and service lines (less than 2-inch diameter) were repaired.
- Ongoing inspections of cross connections and backflow assemblies. In 2002, 372 assemblies were newly installed or replaced, and an additional 1,310 residential irrigation systems were identified as not having required backflow assemblies.
- Completion of the on-site storage building at the Sorrento Water Works facility.
- Fire hydrant inspection and replacement as needed. 67 old and non-standard hydrants were replaced and 90 new hydrants were added to the City's water system in 2002.
- Replacement of malfunctioning water meters. During calendar year 2002, 48 large meters (1½-inch diameter and larger) and 348 small meters (¾-inch and 1-inch diameter) were replaced.
- Ongoing water quality testing. Testing continues to be one of the highest priorities for the City's drinking water program in its commitment to provide premium and safe drinking water to residents. The City collects an average of 120 samples per month for testing to ensure that the City's drinking water meets state and federal standards.

Water Planning/Engineering Work

- Update of the City's water master plan, which is currently being completed.
- City staff participation in water-resource-related committees and work groups in the region (for example, the Regional Water Providers Consortium and the Proposed Bull Run Regional Drinking Water Agency).
- JWC member agencies completed work on revised Master Agreements to ensure the City has a long-term supply from the JWC and Barney Reservoir. The revised agreements will be adopted formally by the JWC in 2003.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

If you have any questions regarding water quality or about information presented in this report, please call us at **503-350-4017.**

Drinking Water Fluoridation

In 2002, the Beaverton City Council referred an advisory ballot measure to a vote of the people of Beaverton regarding whether the City should fluoridate its drinking water. The results of the November 2002 vote supported fluoridation. Subsequently, the Mayor and Council directed staff to move forward with design and construction of the facilities to add fluoride to the City's drinking water. The purpose of fluoridating the City's drinking water is to improve dental health for consumers of Beaverton water. According to the U.S. Centers for Disease Control (CDC) and U.S. Department of Health and Human Services widespread use of fluoride has been a major factor in the decline in the prevalence and severity of tooth decay in the United States. When used appropriately, fluoride is both safe and effective in preventing and controlling tooth decay[1]. The American Dental Association (ADA) endorses the fluoridation of community water supplies as safe, effective and necessary in preventing tooth decay[2]. This support has been the ADA's position since policy was first adopted in 1950[2].

During 2003, City staff will work with an engineering consultant specializing in fluoridation to design and inspect construction of the facilities required to add fluoride to the City's water supply. The facilities also will be equipped with sophisticated monitoring equipment to ensure the desired fluoride dosage is maintained in the water supply

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (1-800-426-4791).

Primary Supply[1]

Major Water Sources: JWC Treatment Plant, Hanson Road Facility Well Water (Recovered ASR Water and Native Groundwater)

Regulated Contaminants	Highest Detection Lowest Concentration	Highest Level Used for Compliance	Allowed (MCL/TT)	Ideal Goals (MCLG)	Major Sources in Drinking Water
MICROBIOLOGICAL					
Total Coliform Bacteria	ND	ND	Must not detect coliform bacteria in more than 5 percent of monthly samples	0	Naturally present in the environment
Turbidity	0.03 NTU	0.07 NTU	As of January 1, 2002, turbidity may never exceed 1 NTU, and must not exceed 0.3 NTU in 95% of daily samples in any month.	N/A	Soil runoff
INORGANICS					
Barium	ND	ND	2000 ppb	2000 ppb	Discharge from metal refineries; erosion of natural deposits; discharge of certain drilling wastes.
Nitrate (as Nitrogen)	ND	1.0 ppm	10 ppm	10 ppm	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Sodium	7.43 ppm	12.7 ppm	No standard	No standard	Added to water during treatment and erosion of natural deposits.
Fluoride	ND	ND	4 ppm	4 ppm	Erosion of natural deposits; discharge from fertilizer and aluminum plants
Copper[2]	90th Percentile = 0.2 ppm	0.37 ppm	AL = 1.3 ppm	1.3 ppm	Erosion of natural deposits; corrosion of household plumbing systems; leaching from wood preservatives
Lead[2]	90th Percentile = 3 ppb	23 ppb (Less than 10 percent of samples exceeded the Action Level)	AL = 15 ppb	0 ppb	Corrosion of household plumbing systems; erosion of natural deposits
RADIONUCLIDES					
Radon	48 pCi/l[3]	870 pCi/l[4]	No standard	No standard	Erosion of natural deposits
Gross Alpha	Not Detected	1.712 pCi/l	15	0	Erosion of natural deposits
Gross Beta	Not Detected	12.2 pCi/l	50[5]	0	Decay of natural and man-made deposits
DISINFECTION BYPRODUCTS AND DISINFECTANT RESIDUALS					
	Range	**Average**			
TTHMs (Total trihalomethanes)[6] Annual rolling average					Byproduct of drinking water chlorination
All sites	13 - 47 ppb	29 ppb	80 ppb	0	
HAAs (total haloacetic acids)[7] Annual rolling average					Byproduct of drinking water chlorination
All sites	0 - 5.3 ppb	26 ppb	60 ppb	NA	
Chlorine	0.19 - 1.02 ppm	0.74 ppm	4.0 ppm (MRDL)	4.0 ppm (MRDL)	Water additive used to control microbes

[1] Data provided by the Joint Water Commission, City of Beaverton and Tualatin Valley Water District.

[2] Lead and copper data from 2001 sampling of 39 locations across the City of Beaverton.

[3] Radon from sample collected on March 14, 2000 at the JWC treatment plant; sample represents surface water; data provided by JWC.

[4] Radon from Hanson Road well. Results represent groundwater concentration.

[5] EPA considers 50 pCi/l to be the level of concern for beta particles.

[6] Total trihalomethanes are disinfection byproducts from the breakdown of chlorine compounds added by the City for disinfection. MCL effective as of January 1, 2002

[7] Haloacetic Acids are disinfection byproducts from the breakdown of chlorine compounds added for disinfection.

MCL effective as of January 1, 2002.

MCL = maximum contaminant level

MRDL = maximum residual disinfection level

ND = Not detected

N/A= Not applicable

The following terms are used to summarize the sampling detects:

Maximum contaminant level (MCL): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Maximum contaminant level goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum residual disinfection level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum residual disinfection level goal (MRDLG): The level of a drinking water disinfectant below which there isnot known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contamination.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Action Level (AL): The concentration of a contaminant which, if exceeded, triggers a treatment or other requirement for a water system to follow.

The following units appear throughout the table:

ND: Not detected

N/A: Not applicable

NTU: Nephelometric Turbidity Units

ppm: parts per million, or milligrams per liter (mg/L)

ppb: parts per billion, or micrograms per liter (μg/L)

pCi/l: picocurries per liter, a standard measurement of beta particles in water

Lead: Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, flush your tap for 30 seconds to 2 minutes before using tap water. If you wish to have your water tested or would like additional information, call the Safe Drinking Water Hotline (800-426-4791).

Radon: Radon is a radioactive gas that you can't see, taste, or smell. It is found throughout the U.S. Radon can get into indoor air when released from tap water from showering, washing dishes, and other household activities. Compared to radon entering the home through soil, radon entering the home through tap water will in most cases be a small source of radon in indoor air. The EPA is in the process of reviewing a new radon rule for drinking water but has not finalized the rule. EPA is considering a drinking water standard for radon that could range from 300 to 4000 picocurries per liter (pCi/L).

Radon is a known human carcinogen. Breathing air containing radon can lead to lung cancer. Drinking water containing radon may also cause increased risk of stomach cancer. The radon found in the native groundwater pumped from the Sorrento site does contain radon; however, this water is normally blended with JWC water, which results in lower radon levels at the taps.

For additional information, call the Oregon Health Division or EPA's Radon Hotline (800-SOS-RADON).

Additional Water Quality Information

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in the water include:

- Microbial contaminants, such as cryptosporidum, viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.
- Radioactive contaminants, which can be naturally occurring or result from oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water to provide the same protection for public health.